Integration of Expert Knowledge Into a Probabilistic Expert System

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Abstract: The paper deals with the problem of integration of additional expert information in the form of univariate marginal distributions into a probabilistic knowledge base defined by a discrete distribution mixture. The suggested solution consists in constructing the I-projection of the original knowledge base on the class of distributions satisfying the additional conditions formulated by experts. The computation of the I-projection is based on the iterative proportional fitting procedure (IPFP) originally designed for contingency tables. The procedure is modified for distribution mixtures with product components and the convergence of the resulting algorithm is proved. Practical application of the method is illustrated by a numerical example.

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AMS Subject Classification: